

What Is Claimed Is:

1. A volume allocating method in a storage management system for managing operation of a storage device connected via a network by use of a storage management server, the  
5 volume allocating method comprising:

receiving, via the network, a condition for allocating a volume designated by a client;

obtaining information on operation history of the volume from a memory device for storing, as history,  
10 information including a performance value of a disk group obtained upon actually operating the storage device;

obtaining information on specification values including the performance value of the storage device;

assuring a performance margin and determining a  
15 candidate of an allocable volume in accordance with the received condition for allocating the volume based on the information on the operation history of the volume and the information on the storage device;

transmitting information on the volume of the  
20 allocated candidate to the client;

receiving information on volume allocation selected and transmitted from the information on the volume of the allocated candidate in the client; and

allocating the volume to the storage device in  
25 accordance with the information on the volume allocation.

2. A volume allocating method according to Claim 1,  
further comprising:

storing previously, in the memory device, a plurality  
5 of policies one of which is selected by designating the  
condition for allocating the volume in the client,  
including information on at least the performance value and  
an operating time zone; and

storing previously, in the memory device, information  
10 on a forecasted performance value per unit time which is  
calculated from a capacity, a theoretical performance value,  
and information on the operation history of the volume of  
the disk group as an allocation target.

15 3. A volume allocating method according to Claim 2,  
wherein the step of determining the volume candidate  
comprises:

obtaining the performance margin based on the  
theoretical performance value and the forecasted  
20 performance value per unit time of the volume included in  
the disk group;

calculating and subtracting the performance value  
designated by the policy from the obtained performance  
margin; and

25 determining, as the allocation candidate, the volume

of the disk group when the obtained value is positive as a result of the calculation.

4. A storage management server for managing the operation of a storage device connected via a network, the storage management server comprising:

a database for operation history which stores, as history, information including a performance value of a disk group obtained upon operating the storage device;

a database for a volume performance value which stores information on specification values including performance, reliability, and a capacity of the storage device obtained from the storage device;

a policy database which stores information on policies including the performance corresponding to a plurality of set policies;

first processing means which calculate a forecasted performance value from the information on the performance value of the disk group stored in the database for operation history;

second processing means which obtain a performance margin, based on a theoretical performance value of the volume and the forecasted performance value obtained by the first processing means; and

volume determination processing means which determine

an allocation candidate of the volume in accordance with a calculation result of the second processing means.

5. A storage management server according to Claim 4,  
5 wherein the first processing means calculate the forecasted performance value per unit time based on information on the performance value obtained from the database for operation history, and

the database for a volume performance value stores  
10 information on the forecasted performance value per unit time obtained by the first processing means, corresponding to the disk group.

6. A storage management server according to Claim 4,  
15 wherein the second processing means perform processing for obtaining a difference between the performance margin per unit time and a designated performance value stored in the policy database, and

the volume determination processing means determine,  
20 as the allocation candidate, the volume which is obtained by the second processing means and has a positive difference.

7. A storage management server according to Claim 4,  
25 further comprising:

means which transmit information indicating a volume candidate determined by the volume determination processing means so as to display the information on a client connected to the storage management server; and

5 means which receive the information on the volume allocation selected by the client in accordance with the displayed information.

8. A system having a storage management server  
10 according to Claim 4, wherein the storage management server has a client connected thereto via the network, and wherein the client comprises:

means which designate and inputting a condition for allocating the volume;

15 display means which display information indicating the volume candidate determined by the volume determination processing means; and

means which transmit, to the storage management server, the information on the volume allocation selected from the  
20 volume information of the allocation candidate displayed on display means.

9. A program for selecting and generating a volume candidate functioning on a storage management server, the  
25 storage management server comprising a database on

operation history for storing, as history, information including a performance value of a disk group obtained by operating a storage device connected via a network, a database for a volume performance value for storing

5 information on specification values including performance, reliability, and a capacity of the storage device, obtained from the storage device, and a policy database for storing information on a policy including the performance corresponding to a plurality of set policies, the program  
10 for generating the volume candidate comprising:

a first processing step of calculating a forecasted performance value from the information on the performance value of the disk group stored in the database on the operation history;

15 a second processing step of obtaining a performance margin based on a theoretical performance value of the volume and the forecasted performance value obtained in the first processing step;

a volume determination processing step of determining  
20 a candidate for allocating the volume in accordance with a calculation result of the second processing step; and

a step of generating information for displaying a volume candidate from information based on the volume determination processing step, so as to display the volume  
25 candidate on a client connected to the storage management

server.

10. A volume allocating method according to Claim 1, further comprising, in the storage management server:

5 previously storing, in a memory device, a plurality of policies including information on at least the performance value and the operating time zone; and

previously storing, in the memory device, information on the forecasted performance value per unit time

10 calculated from information on the operation history of the capacity, theoretical performance value, and volume of the disk group as the allocation target, and

the volume allocating method further comprising, in the client:

15 displaying, on a display screen of the client, information on the plurality of policies transmitted from the storage management server; and

selecting one policy by use of input means of the client, from the plurality of policies displayed on the

20 display screen, and

the volume allocating method further comprising:

displaying, on the display screen, volume information of the received allocated candidate;

selecting and designating one of allocated candidates

25 displayed on the display screen; and

transmitting, to the storage management server,  
information on the designated allocated candidate.

11. A storage management server for managing  
5 operation of a storage device connected via a network,  
comprising:

a database for operation history which stores, as  
history, information including a performance value of a  
disk group obtained upon operating the storage device;

10 a database for a volume performance value which stores  
information on specification values including a performance  
on the storage device;

processing means which calculate a forecasted  
performance value from the information on the performance  
15 value of the disk group stored in the database for  
operation history and which obtains a performance margin  
per unit time based on the obtained forecasted performance  
value and a theoretical performance value stored in the  
database for a volume performance value;

20 volume determination processing means which determine  
a candidate for allocating a volume in accordance with a  
calculation result of the processing means; and

means for transmitting, to a client connected to the  
storage management server, information indicating a volume  
25 candidate determined by the volume determination processing



means.

12. A storage management server according to Claim 11,  
further comprising:

5 a policy database which stores information on a policy  
including the performance corresponding to a plurality of  
set policies.

13. A storage management server according to Claim 11,  
10 wherein the database for a volume performance value stores  
a disk group name, reliability, a capacity, a theoretical  
performance value, and the forecasted performance value  
corresponding to the set disk group.

15 14. A storage management server according to Claim 11,  
wherein the database for operation history stores a disk  
group name and an actual estimated performance value  
corresponding to the set disk group.

20 15. A storage management server according to Claim 12,  
wherein the processing means comprises:

first processing means which obtain the unit time from  
the designated policy and which segment the history  
information stored in the database on the operation history  
25 per unit time;

second processing means which obtain an average of the segmented data and which obtain the forecasted performance value;

third processing means which obtain the performance margin by subtracting the forecasted performance value from the theoretical performance value per unit time and which subtract the performance value designated by the policy from the performance margin per short time; and

fourth processing means which determine whether or not the subtracted value is positive and which determine the volume of the target disk group if the subtracted value is positive.

16. A storage management server according to Claim 11, wherein the client comprises:

means which receive information for allocating the volume selected from the received volume candidates by the client; and

means which transmit, to the storage device, the information for allocating the volume received by the receiving means so as to allocate the volume of the storage device.

17. A system according to Claim 8, wherein the display means of the client displays the information

indicating a name, performance, and reliability of the disk group as the volume candidate.

18. A volume allocating method according to Claim 1,  
5 further comprising:

displaying information including at least the  
performance value and reliability corresponding to the  
policy, an index for selecting a memory capacity, and an  
index for selecting the policy on the display screen of the  
10 client so as to designate the condition for allocating the  
volume by the client.

19. A volume allocating method in a storage  
management system, comprising:

15 receiving a condition on requested performance per  
operating time zone of a volume designated by a client;

referring to history information obtained from a  
result of actually operating disk groups;

calculating a performance margin of the disk group  
20 upon allocating the volumes of the disk groups based on the  
history information,

obtaining a volume candidate as an allocation target  
from the disk groups in accordance with a calculation  
result and presenting the volume candidate to the client;

25 and

receiving and storing one volume candidate selected by the client.

20. A volume allocating method in a storage management system according to Claim 19, further comprising the step of:

displaying the volume candidate as the allocation target on a display screen of the client and selecting one volume candidate of the displayed contents.